

THE
BIOLOGICAL BASIS
of
CHLOROPHYLL

PHYLLOSAN
(PHARMACOLOGICAL CHLOROPHYLL)

AND ITS
THERAPEUTIC INDICATIONS

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THE BIOLOGICAL BASIS OF CHLOROPHYLL THERAPY.

P H Y L L O S A N

(Pharmacological Chlorophyll)
AND ITS THERAPEUTIC INDICATIONS.

The exact part played by iron in the animal economy is difficult to determine. It is essential to the formation of blood, yet its percentage in the hæmoglobin molecule is very small. The chlorophyll of plants, on the other hand, contains no iron, though it appears that magnesium is an essential ingredient in its molecule, and yet it has been shown beyond doubt that iron is essential to the formation of chlorophyll. (1).

There is no doubt that chlorophyll plays the same part in plants as hæmoglobin does in animals, that is, it is essential to respiratory metabolic exchange. The function of hæmoglobin, as of chlorophyll, is to carry both oxygen and carbon-dioxide, the two elements imported in symbiotic exchange. "If we forsake chlorophyll for the sake of new associations with nitrogen, for instance," says Reinheimer, (2) "we shall forego, through wrongful substitution, much of that symbiotic beneficence to which we owe our successful evolution.

The value of green vegetables in the maintenance of human health is beyond question and various hypotheses have been advanced to explain their function. The presence of chemical salts, the electric content of living cells, which disappear when vegetables are desiccated; the more recent hypothesis of vitamins or accessory food factors—all these have been put forward by way of explanation. More recently, however, many workers including Willstatter (3), Nencki, Abderhalden, Buergi, Dr. M. O. Forster, Dr. David Burns, Prof. Baly, the late Sir Arthur E. Shipley, and others, have made researches and a chemical relationship between chlorophyll and hæmoglobin has been determined, an announcement which has been received with interest and enthusiasm by the whole scientific world.

The researches were described in full by Dr. M. O. Forster, F.R.S., in his Presidential Address to the Chemistry Section of the British Association at Edinburgh, 1921 (4). They are also

(1) *The Prescriber*, April, 1922, pp. 137—139.

(2) *Medical Press & Circular*, July 9th, 1924.

(3) Willstatter, R., Untersuchgen. *Über Chlorophyll* (Springer, Berlin).

(4) *Proceedings*, British Association, 1921.

dealt with in many works by English, American and Continental Scientists (see Bibliography).

Prof. E. Buergi, of Berne University has shown that phylloporphyrin ($C_{16}H_{18}N_2O$), a decomposition product of chlorophyll, is very closely related in chemical structure to hæmatoporphyrin ($C_{16}H_{18}N_2O_3$), an iron-free derivative of hæmoglobin; also that hæmopyrrol ($C_6H_{13}N$), can be prepared from both. (1). Buergi deduces from this that chlorophyll ought to be readily transformable into blood-forming compounds in the human body.

“The most detached and cynical observer must glow with a sense of worship when he perceives the relationship,” says Forster. (4). Not only does it dignify the use of green vegetables by transferring them to the domain of therapy, but it throws some doubt on the credentials of those intangible factors called vitamins. Dr. J. M. Hamil (5)—says—“The primary source of the vitamin is, however, the green leaves of plants, and it is from this that plant-eating animals obtain the vitamin and store it in the fatty tissues of their bodies. The vitamin of cod-liver oil must similarly be presumed to have been ultimately derived from the tissues of algæ or sea-water green plants. Again, in winter time, if green food is lacking, the milk of cows and butter made from it are deficient in fat-soluble, A. vitamin.” Prof. Gowland Hopkins of Cambridge University suggests a similar explanation.

Dr. Buergi has isolated pure chlorophyll in the form of an extract called Phyllosan, which represents in concentrated form a considerable quantity of green vegetables. It is a dark-green powder with scarcely any taste and is supplied in the form of tablets 2.5 grains each. Clinical experiments demonstrate beyond a doubt the accuracy of his theory. Clinical reports already published (see below) show that marked improvement takes place after even a few weeks treatment in cases of Anæmia, Emaciation, Wasting Diseases, all forms of Debility (of whatever origin), and Cardiac-Affections in which the heart muscles have been impaired by Arterio-Sclerosis coupled with high blood-pressure.

After lengthy researches Dr. Buergi finally succeeded in elaborating a special method of obtaining Phyllosan (pharmacologically pure isolated chlorophyll absolutely free from toxic and injurious properties).

(5) Report on “Public Health & Medical Subjects,” No. 9. Ministry of Health.

But why, it may be asked, should it be necessary to administer pure chlorophyll when green vegetables are easily obtainable? The answer can be found in Martindale and Westcott's invaluable compendium "The Extra Pharmacopœia." (6) Why use quinine, instead of giving large doses of bark? Why use tinctures or juices or other preparations from seeds, roots, or leaves when one might administer instead corresponding parts of the untreated plants? The reason is that chlorophyll is so locked up in a mass of fibrous matter that little or none is absorbed in the ordinary process of eating, not to mention the fact that cooking destroys its therapeutic properties. Nisheura (7) has shown that only isolated chlorophyll—Phyllosan—is assimilated and separated in the urine as a red porphyrine colouring matter. Kibahua (8) reports that by the administration of ordinary vegetables practically no chlorophyll is absorbed, that no red porphyrine was present in the urine, but that on the other hand, resorption and separation in a high degree were observed after treatment with Phyllosan. (8).

CLINICAL REPORTS.

To detect an active principle and then concentrate it into a convincing form is one thing, to infer that this concentration will give effective result is another; examples familiar to every reader establish this fact.

Confirmation of the claim that Phyllosan would give definite results was sought in clinical experiments in England and other Countries; a mass of data has been collected through the patient investigation of eminent scientists and medical men, which testifies to its efficiency in practice, and places Phyllosan in the category of a valuable therapeutic agent, and this booklet is intended only as an outline of the facts now established. Favourable reports have already appeared in the leading scientific and medical press all over the world; one report in particular deals with a series of hospital cases in which under ordinary treatment, there had been no improvement; Phyllosan was then given and blood specimens of these cases were examined by the Clinical Research Association. (9).

These examinations proved that under the influence of Phyllosan the red blood cells immediately increased in number,

(6) Martindale's "Extra Pharmacopœia" Phyllosan xviii, vol. 1, pp. 823.

(7) Schweiz. med. Wochenschrift No. 20, 1925.

(8) Bioche. Zeits. No. 98, 1922. Die. med. Welt No. 17, April 28th, 1928.

(9) Fuller, A. W. "Anæmia: its causes and modern treatments." (Lewis.)

while their hæmoglobin content rapidly rises, with a profound and invigorating increase of all physical and vital forces—far superior to and more efficient than Iron, Cod-liver Oil, Malt, Hypodermic Injections, etc., Rentz (10), Fuller (9), Ralph (9), Yoshiike, Gordonoff, Kaikawa, Myadera, Buergi (11), and others show that Phyllosan exerts a decided beneficial influence upon the heart muscles, especially in cases of cardiac affections complicated by arterio-sclerosis and other complaints, while the nutrition functions are stimulated. Gordonoff and Rentz (10) found it useful in stimulating the respiratory organs and as a general tonic upon the various organs of the body; it quickens metabolism and builds up power of resistance; it is of material assistance in the restoration to health of convalescent patients. Finally Phyllosan is the only general cell-tonic which is non-toxic, with no gastric disturbances following its use, non-constipating, but a natural peristaltic stimulant and perfectly harmless.

It is obvious that the therapeutic importance of Phyllosan on the blood and body cells must be particularly valuable in those diseases arising from abnormalities in the blood. Published reports show that the recovery of hæmoglobin and R. B.C. content is twice as rapid under Phyllosan treatment as under iron administration. (9a).

PHYLLOSAN IN CARDIAC AFFECTIONS, ARTERIO SCLEROSIS AND HIGH ARTERIAL TENSION.

In cases of cardiac weakness where digitalis treatment gave practically no result, Phyllosan was found to be most valuable. The action of Phyllosan was closely observed in a long series of cardiac affections, in which the heart muscles had been impaired by arterio-sclerosis and other complaints; cardiographic records show Phyllosan to exert a rapid beneficial influence in restoring to normal, and intensely strengthening the cardiac action, together with a decided and immediate lowering of abnormally high blood pressure. (12).

EXAMPLES.

Case (W.P.) Male. Aet. 73. Blood pressure 200-210mm angina pectoris, dyspnœa. After Phyllosan treatment for one month the blood pressure was 170mm and subjective symptoms greatly improved.

(9a) Fuller, A. W. "Some essential factors in the treatment of anæmia." *Medical World*, Jan. 25th, 1924.

(10) Rentz, Eduard. "Some investigations into Pharmacological Chlorophyll," 1927.

Case (D.L.) Male. Aet. 51. Moderate dilatation of the heart. Blood pressure 190mm., would not stand iodine treatment, digitalis treatment no effect. After one week's treatment with Phyllosan subjective improvement already ascertained. After one month blood pressure dropped to 130mm. and the heart symptoms, palpitations, dyspnœa, and giddiness vanished.

Case (A.T.) Female. Aet. 43. Heart greatly enlarged, fatty degeneration, blood pressure 180mm., headaches, giddiness. After Phyllosan for one month, blood pressure reduced to 130mm. and subjective complaints vanished.

Case (E.M.) Male. Aet. 57. Blood pressure 250mm. Phyllosan treatment for 3 months—blood pressure reduced to 180mm.

Case (T.C.) Male. Aet. 48. Blood pressure 180mm., heart dilated towards the left. Phyllosan treatment 6 weeks, disappearance of dilatation and blood pressure reduced to 130mm. Phyllosan continued with periodic interruption and the improvement obtained remained permanent.

ANÆMIA, EMACIATION, DEBILITY, WASTING DISEASES. (In children and adults).

Excellent results are reported on the use of Phyllosan in the treatment of various diseases in which blood poverty, emaciation, debility, etc., are characteristic. The product was found to be most valuable in anæmia, etc., which would not respond to ordinary treatment, not only by an immediate markedly increased hæmoglobin content, but by a profound and decided roborant and invigorating effect on all physical and vital forces (11).

Investigations made by Rentz at the University of Upsala, Sweden (10), show that Phyllosan is a most effective stimulant for the functioning of red bone marrow as the number of leucocytes of polymorphous core in the blood slowly rises and as the thrombocytes due to the megakaryocytes of the bone marrow exhibit an exceedingly strong and continuous rise to two or three times their number in the circulation of the blood.

Clinical reports already published show marked hæmatological improvement even after only one month's treatment. A series of cases which were not improving on ordinary treatment received Phyllosan by Dr. R. S. Ralph (9), blood specimens of these cases were examined by the Clinical Research Association and the improvement in every case was found to be marked after 14 days treatment.

(11) Buergi, Deut. med. Woch. No. 35, 1922.

(12) Munchener med. Woch. No. 47, 1927.

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